

THE NORTH AMERICAN SPECIES OF RYBAXIS

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The little group Rybaxis, call it genus or subgenus as you prefer, was established by Sauley in 1874 to contain a few species definitely separable from Bryaxis by the presence of a sharply impressed biarcuate groove connecting the lateral pronotal foveæ, and a deep submarginal stria on the vertical flanks of the elytra. At that time two species only were known in our fauna which possessed the characters of the new genus, viz.—*Bryaxis conjuncta* described by Le Conte in 1850, and *B. clavata* described by Brendel in 1865 as a supposed "northern climatical form of *conjuncta*, but declared by him the year following to be a distinct species, differing from *conjuncta* in certain sexual characters, notably in having the anterior trochanters armed with a short sharp spine, the same being unarmed in *conjuncta*. In the Crotch Check List of 1873 Dr. Horn changed the name *clavata* to *brendelii*, the former being preoccupied.

On page xli of the Horn Bibliography by Henshaw (Trans. Am. Ent. Soc. 1898) there is a synonymical note from Mr. Schwarz pointing out that while Dr. Brendel had discovered that there were two distinct species included under the name *Bryaxis conjuncta*, one with the front trochanters of the male spined, the other not, through a failure to read Le Conte's original description Brendel in describing his *clavata* with spined trochanters succeeded only in rediscussing Le Conte's *conjuncta*, thus leaving without a name the species with simple male trochanters which he had wrongly assumed to be the true *conjuncta*. Oddly enough Le Conte himself, apparently completely forgetful of his original description, follows Brendel's lead and in his table of the genus in the "Transactions" of 1880 uses the name *conjuncta* for the species with simple male trochanters.

The Schwarz note of nearly thirty years ago however seems to have been generally overlooked and the error there pointed out still awaits adjustment; moreover some recent study by the

writer of available *Rybaxis* material shows that the problem is not quite so simple as at first supposed, for instead of having to do with two species only, I have discovered that we have at least half a dozen species that pass under the old names, of which several satisfy about equally well the descriptions of *conjuncta* and *clavata*.

Obviously, before further progress can be made, it becomes necessary to determine just what *conjuncta* and *clavata* really are. This has been done with the highest degree of probability possible by a critical study of the respective series under these names in the Le Conte and Brendel collections. As a result of this determination, *conjuncta* and *clavata*, supposed by Schwarz to be identical, prove to be quite distinct species.

All our species of *Rybaxis* are superficially very similar, and for the most part are only recognizable with certainty by the secondary sexual characters of the males, the females by themselves being often indeterminable. In all our species the males have the anterior tibiae acutely dentate within above the middle, and in most of them the antennal Club is enlarged and otherwise modified, and the anterior trochanters are apically spined or toothed in this sex. In addition to these characters, all of which are given in the books, the early descriptions of *conjuncta* (1850) and *clavata* (1866) record the presence in the male of acute metasternal processes. These are usually invisible in mounted specimens, and both Le Conte and Brendel seem to have forgotten all about them, for they make no mention of them in their later writings when speaking of sexual characters nor do any subsequent authors appear to have noted their existence.

In the examination of my material I have discovered still another and most remarkable structure which seems to be present with modifications in the males of all species of this genus, and which hitherto has apparently entirely escaped observation. This consists of a very small thin ligula arising perpendicularly from the rear margin of the second ventral segment for a short distance, then abruptly bent forward and more or less expanded into a thin nearly horizontal plate, variable in form and size according to the species, and sometimes to a lesser degree individually. The form of this ventral plate, the position and form

of the metasternal processes, the modifications of the antennal club, and to a less extent the distance apart of the dorsal abdominal carinæ, constitute the chief diagnostic characters used in the table following. Color is of no value whatever, all species probably varying from pale dull yellow to blackish with elytra of some shade of red or brown. Likewise the ordinary distinctions in size, form and sculpture are so slight as to be of little or no use in determining the species.

Table of Species.

1. Median pronotal fovea larger, spongiöse pubescent... *valida*.
Median pronotal fovea small, nude.....2
2. Antennal club a little larger in the male, the last joint with an oblique tooth beneath near the base; dorsal abdominal carinæ unusually approximate, being separated at base by only about one fifth the discal width of the segment.....3
Antennal club in the male with last joint not toothed beneath.....4
3. Metasternal processes posterior in position, feebly developed, consisting merely of obtusely rounded tumidities; ventral plate small, subquadrate..... *truncaticornis*.
Metasternal processes long and acute, similarly posterior in position; ventral plate lacking, but in its place an obliquely erect parallel sided laterally compressed process, its summit blunt..... *obliquedens*
4. Antennal club in the male stouter and more cylindrical, the lower surface flattened and more or less asperate.....5
Antennal club not appreciably modified in the male.....8
5. Pronotum of male more angularly prominent at middle of hind margin; metasternal processes rather widely truncate at apex as viewed from the side..... *conjuncta*
Pronotum much less prominent medially behind, the metasternal processes acute.....6
6. Metasternal processes more nearly median in position; ventral plate moderately transverse, less than twice as wide as long, truncate in front, and either subangulate or

rounded posteriorly; dorsal abdominal carinæ separated at base by slightly less, and at apex by very nearly one-third the discal width of the segment. *clavata*.
Metasternal processes posterior in position. 7

7. Ventral plate of male very strongly transverse, typically fully three times as wide as long; dorsal abdominal carinæ separated even at base by distinctly more than one-third the discal width of the segment. *transversa*.

Ventral plate of male very small, more or less rounded behind, truncate in front, a little variable but usually about as long as wide; dorsal abdominal carinæ separated at base by slightly less than one third the discal segmental width. *mystica*.

8. Metasternal processes of male anterior in position, widely separated, strongly developed and acuminate; dorsal abdominal carinæ separated at apex by one-third the discal segmental width. *varicornis*.

Metasternal processes anterior, short, closely approximate, and blunt at tip; dorsal abdominal carinæ separated at apex by one-fourth the discal segmental width. *geminata*.

Metasternal processes posterior, feeble, being merely obtuse tumidities; dorsal abdominal carinæ separated by only about one-fifth the discal segmental width. . . . *arkansana*.

***Rybaxis valida* Brendel.**

This species is our only one having the median pronotal fovea pubescent and is instantly recognizable thereby. The antennæ are rather slender, all joints, including those of the club, longer than wide, the latter not modified in the male. The dorsal abdominal carinæ are plainly more widely separated than one-third the discal width of the segment. The ventral plate, in the single male at hand in which it can be seen, is quadrate and slightly wider than long. The male front trochanters appear to be unarmed. The size is slightly larger than in any of our other species.

Described from New York and Illinois; specimens before me are from the latter state.

Rybaxis truncaticornis Brendel.

This species was described by Brendel in two lines as a variety of *conjuncta*, as he understood the species. It is however entirely distinct in numerous respects from the supposed as well as the true *conjuncta*, differing from all our other species except the next by the oblique tooth on the lower surface of the last antennal joint in the male. The anterior coxæ of the male are armed with a small apical tooth.

The type locality is Iowa, and all specimens seen by me are from that state; most, if not all of them taken at Iowa City and distributed by Prof. Wickham.

Rybaxis obliquedens sp. nov.

Closely related to the preceding species by the oblique tooth of the terminal joint of the antennæ in the male, and the more than usually approximate dorsal abdominal carinæ; but the metasternal prominences which in *truncaticornis* are feebly developed, are here long and acute. In the form of the process arising from the second ventral segment, with its total lack of a surmounting horizontal plate the present species is unique among our representatives of the genus. The anterior trochanters of the male are armed with a long slender spine instead of a short tooth as in *truncaticornis*.

Seven examples of this species are before me, all sent by Mr. Liebeck. These include 1 ♂ and 4 ♀s from "Pa." (vicinity of Philadelphia), 1 ♂ from Burlington, Iowa) and 1 ♂ without locality. The Pennsylvania male is taken as the type.

Rybaxis conjuncta Le Conte.

The peculiar greater angular prominence of the pronotal disk at the middle of the hind margin in the male, and with it a correspondingly more pronounced angle at the middle fovea between the parts of the biarcuate groove, distinguish this species from all others. This character is only feebly indicated in the female. All three joints of the antennal club in the male are sparsely asperate beneath; the dorsal abdominal carinæ are sep-

arated by $\frac{1}{3}$ the discal segmental width or possibly slightly more (at their apex); the anterior trochanters of the male are acutely toothed at apex; and the apices of the metasternal processes are rather widely truncate. This is one of our larger species and is only equaled or perhaps slightly exceeded in size by *valida* and *transversa* n. sp.

Le Conte's original specimens were described from "provinciis orientabilibus." The only specimen at present in his series which could possibly have served as his type in 1850 is a male of the present species and bears a colored locality disk which signifies Massachusetts or possibly New England. There are in my collection four examples from Three Mile Island in Lake Winnepesaukee, New Hampshire, and I have seen other specimens from Mass.; N. Ill.; Canada (Toronto and Ottawa); Idaho (Coeur d'Alene); and one in Mr. Liebeck's collection labeled "Cal."

***Rybaxis clavata* Brendel.**

Antennal club in the male much enlarged, subcylindrical, flattened beneath, blackish except toward the tip, 9th and 10th joints nearly or quite twice as wide as long, the flattened lower surface strongly asperate almost throughout. Dorsal abdominal carinae separated at tip by $\frac{1}{3}$ the discal width of the segment. Anterior trochanters armed with a slender spine. Metasternal prominences finely acute and more nearly median in position than in any other species. Ventral plate about 1-2 wider than long, truncate in front, narrowed posteriorly.

In his original description of *clavata* Brendel gives no specific locality, but merely states his belief that it is a northern form of *conjuncta*. Later, in his 1890 monograph, he gives as localities "Pa. and Ill." in the table of species, and "Region of the Great Lakes" following his description.

***Rybaxis transversa* sp. nov.**

This species is distinguishable from all others by the very strongly transverse ventral plate, which is nearly or quite three times as wide as long, the vertical lamina supporting it of nearly

equal width, but very short. The antennal club of the male is of the same type as in *clavata* but not quite so stout, the 9th and 10th joints not quite equalling the 11th in width and each less than twice as wide as long, the apical joint asperate beneath, but the 9th and 10th free from asperities except a few marginal ones. The dorsal abdominal carinae are long and strong, the intermediate surface rather strongly impressed along their inner sides, and their distance apart is appreciably greater than 1-3 the discal segmental width. The anterior trochanters of the male are armed with a rather short acute apical tooth. The metasternal processes are strong and subacute at apex, sometimes a little obliquely so.

This is one of our larger species and is of nearly the same size as *conjuncta*.

The type is a male selected from a series of specimens collected at Springfield, Mass., by Mr. Jas. H. Emerton. There are also in my collection a male specimen from Aweme, Manitoba, and a pair taken by myself at Anchorage, Alaska, these last recorded as *brendeli* var. in my recent Alaska List (Pacific Coast Ent. Jan. 1926). I have seen other examples in Mr. Liebeck's collection from "Canada," Franconia N. H., and Westville, N. J.

Rybaxis mystica Casey.

The antennal club of the male is of the same type as in *clavata* and *transversa*, and agrees very nearly with that in the last named species; the interior flattened area of the 9th and 10th joints is free from asperities except a few around the margins, the 11th joint distinctly asperate. Dorsal abdominal carinae separated at tip by 1-3 the discal segmental width, the carinae rather shorter, less strong, and the adjacent surface within them less impressed than in *transversa*. Anterior trochanters of male with a rather long spiniform tooth. Metasternal processes posterior, acuminate at apex. Ventral plate very small, truncate in front, more or less narrowed behind, and varying from slightly wider than long to as long as wide. Average size a little smaller than in *transversa* and *conjuncta*.

The above characters are taken from a series of specimens

in my collection from Tyngsboro Mass. and Kittery Point, Maine. A male from the last named locality sent to Mr. L. L. Buchanan at the National Museum for comparison with Casey's type he finds to be closely in agreement therewith in all essentials. In his description Casey says the terminal antennal joint is as long as the four preceding, but careful measurements made by Mr. Buchanan prove it to be distinctly shorter than the four preceding joints, as is usual. Casey's unique type is from Rhode Island.

***Rybaxis varicornis* Brendel.**

Very similar to *Mystica* and scarcely separable except by the male characters, the females being virtually indistinguishable. The antennal club in the male does not differ from that in the female. Dorsal abdominal carinæ as in *mystica*; anterior trochanters of male unarmed; metasternal processes anterior in position, behind the middle coxæ, well separated; ventral plate very small, as long as or slightly longer than wide, narrowed in front.

This is the species which Brendel erroneously assumed to be the *conjuncta* of Le Conte, and which he distinguished from *clavata* by its unmodified antennal club and simple anterior trochanters in the male. The name *varicornis* was proposed for a variety with the terminal joint of the club yellow. This paler last joint is by no means peculiar to the present species, but occurs not rarely in at least three or four others, usually in the darker colored specimens. The name *varicornis* is used for this species because available, though very little credit attaches to Brendel for his connection therewith.

This is a common species in Massachusetts, and ranges westward through southern Canada at least to Illinois. It is probably more widely dispersed, but the confusion of species in this genus renders many of the records uncertain.

***Rybaxis geminata* sp. nov.**

Antennal club not differing in the sexes; dorsal abdominal carinæ separated at tip by $\frac{1}{4}$ the discal width of the segment;

anterior trochanters of male with a minute denticle beneath, well back from the apex; metasternal processes anterior, short, rather blunt and closely approximate; ventral plate subrectangular and rather less than twice as wide as long. The short anterior approximate metasternal processes are unique in the genus, and the tooth of the front trochanters is more minute and more remote from the apex than in any other species.

The type (σ^7) is one of four specimens from St. Vincent Pa., submitted by Mr. Liebeck, who kindly permits me to retain it.

Rybaxis arkansana sp. nov.

Antennal club unmodified in the male; dorsal abdominal carinae separated at base by not more than $1/5$ the discal width of the segment; anterior trochanters of male with a small apical tooth; metasternal prominences posterior in position, but ill developed and consisting merely of rounded tumidities; ventral plate small, evidently transverse in the type, but apparently as long as wide in a second specimen.

This is one of the smallest species of the genus, and sufficiently distinct by the tabular characters.

Described from two males from Arkansas (Carlisle) collected many years ago by Stromberg.